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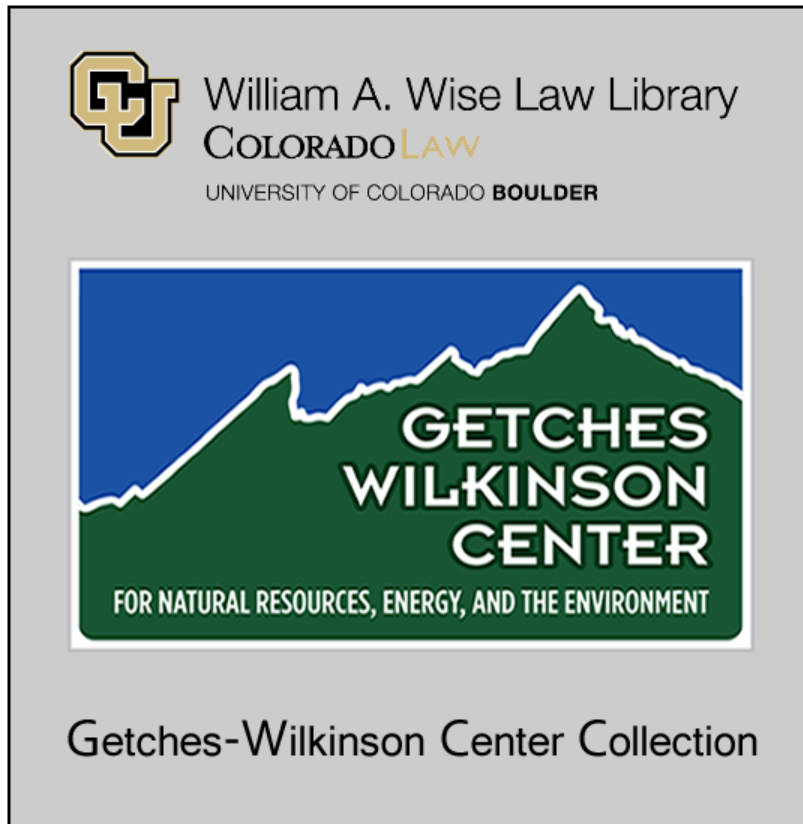


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**Quality Meets Quantity:
San Gabriel Valley, California**

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**Uncovering the Hidden Resource:
Groundwater Law, Hydrology and Policy in the 1990s**

**University of Colorado at Boulder
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Quality Meets Quantity:
San Gabriel Valley, California

I. INTRODUCTION

The San Gabriel Valley Superfund Sites share several characteristics with Superfund sites throughout the country: contamination of groundwater; the presence of PCE, TCE and other organic solvents; and the use of "pump and treat" systems to remove contaminants from groundwater.

In most ways, however, the San Gabriel Valley Superfund Sites are unique. The area of contamination is large (tens of square miles), the aquifer is deep (up to thousands of feet), and the number of people potentially affected by the contamination (actually living on the sites) exceeds one million. Moreover, community involvement in the sites includes more than the usual array of "public interest" groups and Potentially Responsible Parties. It includes 45 water "purveyors" which supply San Gabriel water to wholesale or retail customers; four water districts which supply imported water to supplement San Gabriel's groundwater supplies; a court-appointed "Watermaster" responsible for administering the judicial decision allocating water rights in the basin; and other agencies which have been created to manage, transport, or distribute water in California.

This paper will first describe some of the unique characteristics of the San Gabriel Valley Superfund Sites. The discussion will then focus on the difficulties faced when a superfund cleanup is imposed on a drinking water basin with a pre-existing legal, political, and institutional infrastructure. It will also examine the response of the various members of the infrastructure to the superfund program and the cleanup objectives and methods of the U.S.EPA.

II. BACKGROUND

A. Site Background

The San Gabriel Valley Superfund Sites, Areas 1-4, are located in suburban Los Angeles County in Southern California. (Figure 1) Four areas of groundwater contamination were listed on the National Priorities List ("NPL") as San Gabriel Valley

Areas 1-4 in 1984, but EPA manages them as one site because they all lie within one hydraulically-connected alluvial basin. The Sites occupy approximately 175 square miles and include significant portions of the cities of Azusa, Baldwin Park, Irwindale, La Puente, Industry, West Covina, El Monte, South El Monte, Monrovia, Arcadia, Rosemead, and Alhambra. The sites include industrial, commercial, and residential areas, with relatively little undeveloped land. Hundreds of facilities in the valley have used the chemicals now found in the groundwater since as early as the 1940s.

The San Gabriel valley itself is bounded to the north by the San Gabriel Mountains, which rise to 10,000 feet above sea level, and to the east and west by a series of low sedimentary hills. The valley is a broad plain that slopes north to south at an average of 65 feet per mile from the foot of the San Gabriel Mountains toward a gap in the hills called the Whittier Narrows, which provides the basin's primary natural outlet for surface and groundwater. (Figure 2)

The San Gabriel basin aquifer consists primarily of highly permeable gravel and cobble deposits with interbedded lenses of clays, particularly in the south. Regional groundwater velocities range as high as 1000 feet per year. The basin is deep. It is believed to be 4000 feet deep near its center, and capable of holding close to 10 million acre-feet of water (1 acre-foot = 326,000 gallons).

More than one million southern California residents depend on the aquifer for virtually all of their drinking water. This is an anomaly in Southern California where most water demands are met by surface water imported from outside the region. Since at least 1953, however, more water has been extracted from the basin each year than is recharged through precipitation and runoff. The overdraft is dealt with through artificial recharge of imported surface water into highly permeable "spreading basins" where it percolates into the groundwater. Imported supplies are becoming increasingly limited, however, and could never replace the San Gabriel basin's groundwater supply.

B. Nature and Extent of Contamination

The San Gabriel Sites were listed on the NPL because of contamination of groundwater by volatile organic compounds (VOCs). Contamination is known to occur at depths as great as 700 feet, and may extend much deeper. Roughly 35 of the valley's 170 square miles, and numerous public water supply wells, lie above groundwater contaminated with VOCs at concentrations above drinking water standards.

The contamination was "discovered" in 1979 when 1800 parts per billion (ppb) of trichloroethylene (TCE) were detected in a public water supply well (the MCL is 5 ppb). Subsequent sampling identified numerous other wells contaminated with TCE, perchloroethylene (also known as tetrachloroethylene or PCE), and/or carbon tetrachloride (CTC) at unacceptable levels. Numerous wells are believed to be at risk if action is not taken to stop or minimize further migration of the contamination.

C. Water Production within the Basin Before Superfund

In the 1950s, water interests in the Central Basin, located immediately down gradient of the San Gabriel Basin, became concerned that increasing water demands in the San Gabriel Basin would limit the flow of water from San Gabriel Basin into the Central basin. In 1964, in Board of Water Commissioners of the City of Long Beach et al. v. San Gabriel Valley Water Company et al., Los Angeles Superior Court Case no. 722647 (the "Long Beach Judgement"), the Court guaranteed that an average usable supply of San Gabriel River water must flow through the Whittier Narrows into the Central Basin. This judgment left the 45 water purveyors, the 105 individual water-right holders, and the three municipal water districts within San Gabriel Valley to divide the remaining water. In 1973, in Upper San Gabriel Valley Municipal Water District v. City of Alhambra, Los Angeles Superior Court Case No. 924128 (the "Alhambra Judgement"), the Court allocated water rights among the water purveyors within the San Gabriel Basin. Watermasters administer both judgments, and purveyors pumping more than their allotments are assessed a fee to "import" water into the Basin.

The individual water purveyors within the Basin have been confronted with increasing contamination for several years and have taken steps to ensure that the water from their wells meets drinking water standards. Purveyors have dealt with the contamination in one or more of the following manners:

- Blending contaminated water with water from other wells, so that the blended water remains within standards.
- Shutting down contaminated wells and developing new wells in clean areas of the Basin or in deeper parts of the aquifer.
- Buying supplemental water supplies from outside the Basin or from purveyors not yet affected by the contamination within the Basin.
- Installing some form of treatment system for pumped water.

While each of these measures ensures that the individual water purveyors provide water that meets drinking water standards, the steps fail to provide a long-term solution to the overall Basin contamination, and, in some cases, such measures may exacerbate the contamination problem. For example, shutting down contaminated wells decreases containment of contamination in that area. Installing new wells or deepening existing wells can draw contamination into previously uncontaminated areas.

The potential for independent actions to complicate the contamination problem led U.S.EPA and the California Department of Health Services (now part of the CalEPA) to call on the creation of a local agency with the power to regulate both the quantity of water produced within the Basin and Basin usage for water quality. U.S.EPA issued a Basinwide Technical Plan, which provided a broad outline of the technical issues associated with cleanup of the Basin, and the Agencies presented a "White Paper" in April 1990, which set forth the following authorities needed by such an agency:

1. Regulate basin usage for water quality purposes;
2. Construct and operate facilities for water quality purposes:

3. Obtain funding for water quality purposes and remediation;
4. Manage available funds to implement Basinwide Technical Plan;
5. Respond to public interests;
6. Cost recovery;
7. Issue bonds to finance capital improvements for water quality purposes;
8. Identify and control sources of contamination;
9. Conduct continuing investigations and monitoring;
10. Review and revise the Basinwide Technical Plan;
11. Coordinate efforts of involved federal, state, and local agencies; and
12. Develop and coordinate conjunctive use.

The desire to see the establishment of a local authority with control over both quality and quantity issues and the need for a cleanup of the Basin consistent with statutory requirements created the impetus for conflict between U.S.EPA and the pre-existing infrastructure in the Basin.

II. Integration of Water Quality and Quantity

A. Introduction of Superfund to the San Gabriel Valley

Prior to the listing of the San Gabriel Basin on the NPL, water production, as explained above, was left almost exclusively to the auspices of the Watermaster and the individual water purveyors. Provided that sufficient water flowed to Central Basin and the supplied water met drinking water standards, the water producing industry had a free hand in the management of the Basin. Many individual water purveyors had long regarded the groundwater within the Basin to be their private property limited only by the two Court judgements.

The listing of the San Gabriel Basin on the NPL dictates that certain actions take place within the Basin. Among these actions are completion of a Remedial Investigation/Feasibility Study ("RI/FS"), the issuance of a Record of Decision ("ROD"),

and the implementation of Remedial Design/Remedial Action ("RD/RA"). The goal of these, and other actions, is the cleanup of the Sites. Only upon the obtaining of the cleanup goals established in CERCLA, the NCP, and applicable state law, unless such cleanup goals are waived by U.S.EPA, will the San Gabriel Valley Superfund Sites be deleted from the NPL. To achieve this cleanup it is imperative that the superfund program and the existing Basin infrastructure be integrated.

EPA has enunciated five goals in the Basin:

1. Prevent exposure of the public to contaminated water;
2. Maintain an adequate water supply;
3. Protect natural resources;
4. Control migration of contaminated groundwater; and
5. Remove contaminated water.

U.S.EPA has integrated these five goals into its superfund process. To date U.S.EPA has begun work on five operable units (OU) at the San Gabriel sites. The objectives of the first three OUs, Richwood Mutual, Suburban Water Systems, and Whittier Narrows, have been to provide safe drinking water and to prevent the contamination from spreading into the down-gradient groundwater basin.

The Richwood and Suburban OUs were "fund lead" projects. This indicates that the superfund trust fund provided the resources to undertake the RI/FS as well as the RD/RA work at the projects. U.S.EPA will determine the viability of a "cost recovery" action against Potentially Responsible Parties ("PRPs") to recover public funds expended at a later date. The RI/FS work at the Whittier Narrows OU is also fund lead, however, the RD/RA aspect of this OU is currently anticipated to be enforcement lead. In this mode, U.S.EPA will seek funding from the PRPs in the Basin to complete the RD/RA.

The fourth OU currently underway in the Basin is the Puente Valley OU. This OU is intended to address containment and

extraction of contamination in a sub-basin which is a tributary to the main San Gabriel Basin. This OU will be entirely enforcement lead. Special notice for the OUFS is scheduled for September 1992.

The fifth OU currently underway in the Basin is the Baldwin Park OU. This is the first OU intended to address the largest area of VOC contamination located in the middle of the basin. The OU's remedial objectives are to minimize further spreading of the contamination within the basin and remove contaminant mass from the aquifer. The OUFS for the Baldwin Park OU was fund lead, the RD/RA is anticipated to be enforcement lead. To facilitate its enforcement actions in the Basin, U.S.EPA has issued over 300 General Notice letters in the Basin.

Many institutional and legal issues which must be overcome to successfully implement cleanup include: (1) seeking an amendment to the Alhambra Judgement to allow for the export of water from the Basin and a change in the allowable fluctuation of water height in the Basin; (2) the ability of the individual water purveyors to coordinate their activities and accept the potential that individual pumping patterns may need to be modified; and (3) the integration of a conjunctive use project, should one be selected in the Baldwin Park ROD, into a superfund settlement with PRPs. The first constraint will be the easiest to overcome. The general responses of the water and PRP community to superfund and U.S.EPA's objectives indicate that overcoming the latter two obstacles may be considerably more difficult.

B. Institutional and Legislative Responses to the Superfund Program in the Basin

A multitude of parties have reacted to the introduction of superfund response actions and enforcement into the Basin. The concerns expressed by the water producers, the PRPs, and the legislators fall into three categories: (1) responses by existing water production entities in the Basin to U.S.EPA's call for a new local agency and the need for coordinated water extraction to meet cleanup objectives; (2) responses by PRPs to

potential superfund enforcement action(s) in the Basin; and (3) legislative reactions by state and federal representatives from the Basin to the first two group of responses. The responses illustrate the difficult legal and institutional issues that remain in the Basin. Specific responses by the Watermaster, the Main San Gabriel Basin Water Quality Authority, PRPs, and state and federal representatives to the superfund program in the Basin are discussed below.

1. Watermaster's Response to Superfund

Subsequent to the issuance of the "White Paper," the Watermaster sought an amendment to the Alhambra Judgement to allow it to address water quality issues in addition to water quantity issues. Several parties, including the Sierra Club and the Los Angeles District Attorney's Office, expressed concern that because the Watermaster was not a public agency and that the Watermaster tended to reflect the interests of the water purveyors, that the Watermaster was not the appropriate entity to regulate the Basin for this purpose.

The Court granted the Watermaster's petition for expanded powers; but also took steps to address the concerns expressed by the Sierra Club and others. In its INTENDED DECISION, issued on December 10, 1990, that Court stated that the Watermaster was not a public agency and that due to its nature, did not possess, nor could it acquire, the "wide and varied public qualities which are necessary to administer the Superfund cleanup of the Basin." In the Final Order amending the Alhambra Judgement, prepared by Watermaster, the power was granted to the Watermaster to ensure that both the quantity and quality of the Basin are preserved and its utilization maximized. The Order also directed the Watermaster to develop an adequate and effective program of Basin management, and afforded Watermaster the "power to control pumping in the Basin by water producers therein for Basin cleanup and water quality control so that specific well production can be directed as to a lesser amount, to total cessation, as to an increased amount, and even to require pumping in a new location in the Basin." The Final Order, however, specifically reflected

the Proposed Order and stated "Watermaster's right to regulate pumping activities of Producers shall be subordinate to any conflicting Basin cleanup plan established by the EPA or other public governmental agency with responsibility for ground water management or clean up."

In response to its new powers, the Watermaster proposed Rule 28 in early 1991, as a revision to its rules and regulations to address water quality concerns. As originally drafted, the Operating Principals set forth in Rule 28 provided:

Any new or increased extraction to meet water supply needs should include water quality treatment in areas of concentrations which exceed MCLs. Major actions such as new installations or major modifications of existing wells will be allowed unless such actions are shown to have a potential adverse effect on water quality and are approved in advance by Watermaster. In giving such approval, Watermaster shall consider the cumulative effects of multiple actions by all Producers in the area of concern.

REVISED DRAFT BY RULES AND REGULATIONS COMMITTEE, PROPOSED AMENDMENTS TO WATERMASTER RULES AND REGULATIONS, Section 28(e). The regulatory agencies involved in the Basin expressed concern over the proposed Rule. In comments on the proposed rule, U.S. EPA and the Los Angeles Regional Water Quality Control Board ("Regional Board") expressed concern over the basic premise of the operating principals; i.e., that major actions will be allowed unless the actions are shown to have potential adverse effects. The concern was over where the burden of proof should lie in situations where limited data was available, and the level of proof required to "show" potential adverse effects. The concern was heightened by comments provided by the Watermaster to the Region Board regarding proposed changes to the Region Board's Water Quality Control Plan. In these comments, Watermaster's representative stated that actions "should be allowed unless, based upon persuasive technical data then available, such actions are shown to have a significant potential to degrade groundwater below drinking water quality standards." (Letter from Arthur

Kidman to the Regional Board, February 20, 1991) The agencies maintained that the burden of proof should be on the party proposing the change, and that concern should be focused on degradation in water quality - not merely over the issue of exceeding water quality standards.

In response to these comments Watermaster promulgated a revised Rule 28. This revised Rule provides the following Operating Principles:

Any new or increased extraction by a Producer in the Basin to meet water supply need shall have prior Watermaster approval, shall not contribute to contaminant migration, and shall include planned treatment in existing areas of high-level of degradation and contamination. In giving such approval, Watermaster shall consider the cumulative effects of multiple actions by all Producers in the area of concern by using available information, the 5-year plan, and groundwater modeling.

A RESOLUTION OF THE MAIN SAN GABRIEL BASIN WATERMASTER AMENDING ITS RULES AND REGULATIONS BY ADDING SECTION 28 THERETO, RELATING TO GROUND WATER QUALITY MANAGEMENT, Section 28(e), June 5, 1991.

While the final rule appears to address the concerns of the regulatory agencies, the application of Rule 28 has fallen far short. Watermaster technical review of projects has, at times, been inadequate, and in at least one instance, Watermaster provided its approval for a project after the project had been implemented. The net result of these actions indicates that the Watermaster is committed to address superfund and the regulatory agencies in the Basin by changing the language governing water management in the Basin - but its commitment to change water management practices in the Basin remains uncertain. The failure of the Watermaster to manage the Basin for water quality, in addition to quantity, issues has persuaded U.S.EPA that there remains the need to establish a local agency, in addition to the Watermaster, to address these concerns.

2. Joint Powers Authority's Response to Superfund

In November 1990, the three municipal water district in the Basin formed the Main San Gabriel Basin Water Quality Authority ("Authority"). The Authority, a public agency, was formed to coordinate the plans and related projects of local water purveyors, Watermaster and Federal, State and other local government entities. (Joint Exercise of Powers Agreement Creating the Main San Gabriel Basin Water Quality Authority ("JPA"), page 3.) In addition, however, the JPA also provided that "[i]t is the intent of the parties of this Agreement that the Authority should enter into a cooperative agreement with Watermaster to implement the intent of the Joint Resolution and to accomplish such other matters as Watermaster and the Authority may deem appropriate." (JPA page 10.) The linkage between the Authority and the Watermaster made explicit in the JPA is reinforced by the fact that the Authority is dependent upon the Watermaster for both its financial and technical resources. To date, the result is that the Authority provides the "public agency" shell for the Watermaster.

The Authority, in an effort to address the integration of quality and quantity in the Basin retained Bill Dendy & Associates to develop a TEN-YEAR STRATEGY TO INITIATE A COOPERATIVE APPROACH TO CLEANUP OF CONTAMINATED GROUNDWATER IN THE MAIN SAN GABRIEL GROUNDWATER BASIN ("Strategy"). The Strategy, as its name indicates, was designed to establish a cooperative approach to cleanup of the basin. The goals of the Strategy are: (1) increased speed of Basin cleanup; (2) limiting transaction costs; and (3) institutionalizing the role of PRPs and the water producers in the cleanup process. In comments on the Strategy, U.S.EPA explained that the suggestions in the Strategy, as drafted, would not accomplish the stated objectives. The Strategy focused its cleanup attention on OUs already underway by U.S.EPA and failed to provide a bar on pre-enforcement review (limiting its ability to speed cleanup); did not address third party litigation (detracting from its ability to limit transaction costs); and failed to recognize that a

superfund consent decree would institutionalize the relationship between U.S.EPA, PRPs, and water producers to the extent such producers elected to sign a Consent Decree. In sum, while represented as a tool to enhance cleanup of the Basin, the Strategy, in reality, appeared to be a method by which a local water agency management could obtain control over the construction and operation of facilities associated with cleanup actions in the Basin.

3. The PRPs' Response to Superfund

The PRP community has reacted to EPA's superfund enforcement in two distinct ways: (1) contesting the issuance of General Notice letters and the requirement for individual site investigation work; and (2) forays into the political arena. The first type of PRP response is similar to responses at superfund sites around the country. The vast numbers of PRPs in San Gabriel Valley, however, means that the cumulative impact of such actions is the slowdown of overall Basin cleanup as the time and resources of the regulatory agencies are diverted to address individual enforcement actions. While this type of PRP reaction is more prevalent, it is the second type of response, forays into the political arena, that have attracted the most attention and have the greatest potential to alter the Basin infrastructure.

Individual PRPs have joined together in several groups within the Basin to better represent their views to both state and federal elected officials. The PRPs have attempted to portray their solutions to the contamination as more equitable, quicker, and less expensive than the superfund process. While the PRP suggestions are too numerous, and often times too poorly defined, to review in total, some of the specific suggestions and their implications on cleanup of the Basin are reviewed below.

PRPs have suggested that the Basin should be transferred to a "state lead site." Currently, U.S.EPA is the lead agency in the Basin and CalEPA is the support agency; the proposal would switch the hierarchy. This switch, however, will not alter the fact that the Basin is a superfund site and will not alter the cleanup standards that must be achieved at the Sites.

PRPs have also suggested that the goals of the San Gabriel Valley cleanup be altered to reflect the more limited objectives that: (1) water extracted from the Basin for drinking water purposes meet appropriate water quality standards; and (2) reasonable steps be taken to prevent problematic concentrations of VOCs from migrating into Central Basin. These diminished expectations are, arguably, not sufficient to satisfy the requirements of CERCLA, the NCP, or state law, and implementation of these reduced goals would preclude the use of the Basin in a conjunctive use manner. This proposal, would, however, remove the need, at least in the short term, to coordinate pumping patterns of the individual water purveyors in the Basin. Water purveyors, under this proposal, would be required to simply meet the same standards they are currently required to achieve. As explained early on in this paper, individual actions to meet such objectives are often inconsistent with long term cleanup objectives. The reduced need to have a central local agency address both quality and quantity concerns means it is likely that this suggestion will find support among some water purveyors.

4. Legislative Responses to Superfund

There have been both state and federal legislative responses to the San Gabriel Basin contamination. The various proposed state legislation has focused primarily on the competing water interests within the Basin. Depending on the perspective of the sponsoring legislator's constituent a range of local agencies and funding mechanisms have been proposed. The suggestions for a local agency have included proposals that the Watermaster continue its role in the Basin as well as proposals calling for the creation of a new "super agency" with all the authorities listed in the White Paper. Proposed funding mechanisms have ranged from suggestions for a tax on all industry within the Basin to fund cleanup to the assessment of annual pumping taxes on water producers in the Basin. To date, however, no proposal has garnered sufficient support to be enacted.

The major federal legislation addressing the San Gabriel Valley contamination is a Bill introduced by Representative Esteban Torres which would amend the Federal Water Pollution Control Act by establishing a "San Gabriel Basin Demonstration Project." The Bill would require, among other things, that U.S.EPA enter into contracts with enough individual PRPs to cover 50% of the anticipated costs of cleanup of the Basin; that credit be afforded to PRPs for all previously approved projects; and that the costs associated with cleanup be allocated according to a scheme provided in the Bill. Like the suggestions forwarded by the JPA and the PRPs, the objective of the Bill is to find a quicker, more equitable, and less expensive solution to the San Gabriel Valley contamination. Unfortunately, the Bill may fail to provide sufficient tools to accomplish these goals.

The Bill would replace a perhaps imperfect, but established process (i.e., Superfund) with a vaguely defined alternative which could lead to substantial delays as the roles of various agencies, allocation formula, and other provisions are interpreted. The Bill would require EPA staff to delay or stop work on existing projects to meet the Bill's requirements and deadlines. The net effect could be to slow cleanup. Finally, contrary to CERCLA, which provides a bar on pre-enforcement review, the proposed legislation provides no mechanism to ensure that PRPs dissatisfied with the implementation of the San Gabriel Basin Demonstration Project do not use litigation to delay cleanup.

III. CONCLUSION

The introduction of superfund to address the contamination of the San Gabriel Valley has thrust a new legal, political, and institutional infrastructure on a pre-existing community that was both unprepared and unhappy about the meeting. The net result has been a series of moves by the San Gabriel water, PRP, and political community to develop alternatives to the federal superfund program that will enable the water, PRP, and political community to ^{be} independent from any superfund cleanup in the Basin. To date, the suggestions have failed to address the fact that any

proposed solution must also address the superfund program cleanup objectives. Only a proposal that achieves the required superfund cleanup objectives will enable U.S.EPA to allow the implementation of such a suggestion as an alternative to the superfund program.

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**Figure 1. Location of the
San Gabriel Valley Superfund Sites**

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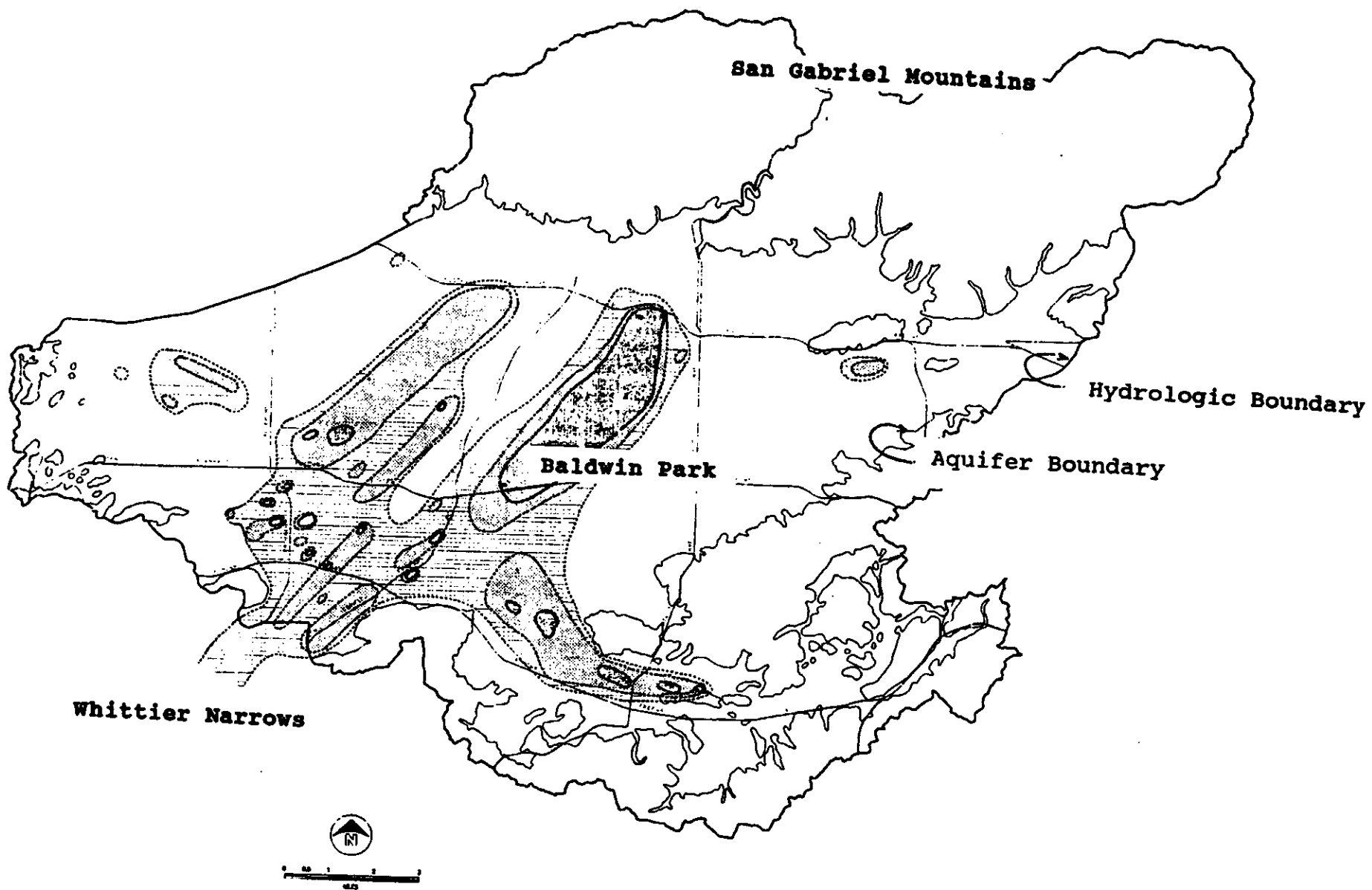


Figure 2. Location of Physical Features and Approximate Areas of Groundwater Contamination in the San Gabriel Basin

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